Tachograph programmer CD400

User manual

CD400 V2.0 r07 b10 (9/01/2014)

Index

1. Introduction 3
1.1. What is a tachograph? 3
2. Description 3
2.1 Technical specifications 3
2.2. Keyboard 4
2.3. Connections 4
3. Operation 5
3.1. Power supply and tachograph type detection 5
3.2. Menu trees 6
3.2.1. KTCO 13xx/1318 6
3.2.2. MTCO 1324/1390 6
3.2.3. Motomet.EGK100 7
3.2.4. Kienzle 1319 8
3.2.5. V.Root VR2400 9
3.2.6. Digital VDO 10
3.2.7. Digital SE5000 11
3.2.8. Digital ACTIA 12
3.2.8. Digital EFAS 13
4 Functions description 14
4.1. Measure W 14
4.1.1. Manual 14
4.1.2. Photo Sensor 15
4.1.3. Rolling road 15
4.1.4. Constant speed. 15
4.1.5. Draw-wire. 15
4.1.6. Odometer (only for digital tachographs) 16
4.2 Measure K 17
4.3. Parameters 17
4.4. Speed test 17
4.4.1 Manual 17
4.4.2 Automatic 18

4.5. Odometer test 19
4.6. Read DTCs 20
4.7. Erase DTCs 20
4.8. Sensor Pairing (Kitas activation) 21
4.9. Clock test 21
4.10. PIN code 22
4.11. Select tachograph 23
4.12. Product info 23
4.13. Language 23

1. Introduction

1.1. What is a tachograph?

Basically, a tachograph is a device that measures and records the speed and distance driven by a vehicle.
The data are recorded in the form of graphics on a paper disk.
The new digital tachographs record those data on its embedded memory and also on the smartcard of the driver.

2. Description

2.1 Technical specifications

- Graphic FSTF LCD Display:
100 x 32 px (4 lines x 20 char) - White LED backlight

- Size: 150 x 100 x 45 mm

- Supply voltage: 9 to 30 VDC

- Supply current: 12mA

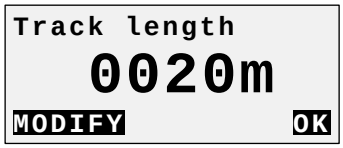
- Case: green-blue ABS (IP40)

- Operating temp: -20…+70°C

- Weight: 155g

2.2. Keyboard

- Alternate function keys 'F1', 'F2' & 'F3' are active when a function in inverted video appears on the bottom line of the display.



F1= MODIFY, F3=OK

- Alernate function key '↑' & '↓' are used for example to navigate the menus.

- Alernate function key '←' & '→' are used to select the digit in some parameters.

- 'Ent' (=Enter) is used to select a function or enter a value.

- 'Esc' key is used to go back in the menu, leave a function, to erase the last digit entered and to switch the programmer ON & OFF when powered by the battery.

2.3. Connections

- Left connector:
Serial port for software upgrade (upgrade cable).

- Center connector:
Connection for crocodile clip cable (K13xx/K1318).

- Right connector:
Connection for tachograph cable.

3. Operation

3.1. Power supply and tachograph type detection

For all tachograph types, except for the K13xx/1318 and the FTCO1319, the programmer is powered by the tachograph itself. An automatic tachograph type detection is executed on power ON, so don't switch the programmer ON, simply connect it to the tachograph with the appropriate cable. The programmer will switch ON and detect the tachograph type.

In the case of the K13xx/1318 and the FTCO1319, switch the programmer ON pressing the 'I/O' key.
If the FTCO1319 is connected, the programmer will detect it.
To switch the programmer OFF, press and hold the 'I/O' key.

If no tachograph is detected, the K13xx/1318 will be selected by default.

On power ON, the programmer will display the product information (Software version, Serial number, etc...), then the menu for the tachograph type detected.

3.2. Menu trees

The functions available in the main menu depend on tachograph model detected (or selected manually).
The tachograph model appears on the top line.

3.2.1. KTCO 13xx/1318

```
  KTCO 13xx/1318

1.Measure W          1.Manual
                     2.Photo sensor

2.Measure K

3.Speed test         1.Manual
                     2.Automatic

4.Odometer test
5.Clock test
6.Select Tacho.
7.Product info.
8.Language.
```

3.2.2. MTCO 1324/1390

```
  MTCO 1324/1390

1.Measure W          1.Manual
                     2.Photo sensor

2.Parameters         1.K Factor
                     2.Odometer
                     3.Instal. Date
                     4.Calibr. Date
                     5.Time & Date
                     6.O/P shaft
                     7.Service delay
                     8.CAN priority
                     9.Binary code
                     10.Product Code
                     11.VIN
                     12.N-RPM Factor
                     13.L-Tyre
                     14.Serial number
                     15.Maximum speed (1390 only)

3.Speed test         1.Manual
                     2.Automatic

4.Odometer test
5.Erase DTCS
6.Sensor pairing
7.Clock test
8.Select Tacho.
9.Product info.
10.Language.
```

3.2.3. Motomet.EGK100

Motomet.EGK100

1.Measure W	**1.Manual** **2.Photo sensor**
2.Parameters	**1.K Factor** **2.Kn** **3.U1** **4.U2** **5.U3**
3.Speed test	**1.Manual** **2.Automatic**

4.Odometer test
5.Select Tacho.
6.Product info.
7.Language.

3.2.4. Kienzle 1319

```
  Kienzle 1319

1.Measure W          1.Manual
                     2.Photo sensor

2.Measure K

3.Parameters          1.K factor
                      2.Odometer
                      3.Instal. Date
                      4.Calibr. Date
                      5.Odometer Unit
                      6.Speed Warning
                      7.Fitter Number
                      8.Clock Speed
                      9.Kn ON/OFF
                     10.Kn Max
                     11.Kn Warning
                     12.Code
                     13.Mercedes ID
                     14.EEC Tacho.
                     15.SWISS ABZ
                     16.Driver change
                     17.4imp/m output
                     18.Note
                     19.Service
                     20.Tot. distance
                     21.Model
                     22.Serial number
                     23.Electronics
                     24.Code SO
                     25.Code ME
                     26.Code PR

4.Speed test         1.Manual
                     2.Automatic

5.Odometer test
6.Clock test
7.Select Tacho.
8.Product info.
9.Language.
```

3.2.5. V.Root VR2400

V.Root VR2400

1.Measure W	**1.Manual** **2.Photo sensor**
2.Parameters	**1.K factor** **2.Odometer** **3.Pulse per rev.** **4.Idle rpm** **5.Economy rpm** **6.Poor Econ. rpm** **7.CANBus RPM** **8.RPM Display** **9.Dist displ.0s** **10.DTCs Display** **11.Overspd Flash** **12.Overspeed** **12.Time & Date** **13.O/P shaft** **14.4th Chart Tr** **15.CANBus enable** **16.CAN Type** **17.Dual Axle** **18.D.Axle Ratio** **19.D6 pin funct.** **20.Speedo.OP fact** **21.Serial Comms** **22.Ignit.On rec.** **23.Driver 2 Duty** **24.Reset HeartBt** **25.Eject pin code** **26.Sensor type** **27.Service Delay** **28.Installat.date** **29.Calibrat. date** **30.Repair Shop ID** **31.Vehicle ID n°**
3.Speed test	**1.Manual** **2.Automatic**

4.Odometer test
5.Erase DTCS
6.Sensor pairing
7.Clock test
8.Select Tacho.
9.Product info.
10.Language.

3.2.6. Digital VDO

DIGITAL VDO

1.Measure W	1.Manual 2.Photo sensor		
2.Parameters	1.Calibration	1.W factor 2.K factor 3.L (Tyre Circ.) 4.Tyre Size 5.Max.Auth.Speed 6.Odometer 7.Time & Date 8.Next Cal. Date 9.Veh.Reg.Nation 10.Veh.Reg.Number 11.Veh.Id.Number	
	2.Other param.	1.ResetHeartbeat 2.TCO1 priority 3.O/P shaft 4.CAN rep.rate	
	3.Manufacturer	1.Part number 2.Drv1 ign.ON 3.Drv2 ign.ON 4.Drv1 ign.OFF 5.Drv2 ign.OFF 6.D1D2 Record 7.RPM Record 8.Speed Record 9.Install. date 10.ResetHeartbeat 11.CAN error	12.CAN2 TC01 mess 13.CAN2 WakeUp D3 14.CAN2RemoteDown 15.RD interface 16.Speed Warning 17.Illum.mode 18.IMS Activation 19.IMS source 20.IMS factor 21.VDO Counter
	4.Information	1.Supplier Id 2.Manufact. Date 3.Serial number 4.Hardware number 5.Hardware vers. 6.Software number 7.Software vers. 8.License number	
3.Speed test	1.Manual 2.Automatic		
4.Odometer test			
5.Read DTCS			
6.Erase DTCS			
7.Sensor pairing			
8.Clock test			
9.PIN code			
10.Select Tacho.			
11.Product info.			
12.Language.			

3.2.7. Digital SE5000

DIGITAL SE5000

1.Measure W	1.Manual 2.Photo sensor		
2.Parameters	1.Calibration	1.W factor 2.K factor 3.L (Tyre Circ.) 4.Tyre Size 5.Max.Auth.Speed 6.Odometer 7.Time & Date 8.Next Cal. Date 9.Veh.Reg.Nation 10.Veh.Reg.Number 11.Veh.Id.Number 12.O/P shaft	
	2.Other param.	1.ResetHeartbeat 2.TCO1 priority 3.O/P shaft 4.CAN rep.rate 5.Part number	
	3.Manufacturer	1.Part number 2.CanBus activat 3.Speed Corr. 4.D6 5.D4 6.Light input 7.RPM input 8.Default lang. 9.Serial Output	10.D1D2 Record 11.RPM Record 12.Speed Record 13.Kn factor 14.Install.date 15.IMS Source 16.IMS Gain 17.IMS Factor
	4.Information	1.Supplier Id 2.Manufact. Date 3.Serial number 4.Hardware number 5.Hardware vers. 6.Software number 7.Software vers. 8.License number	
3.Speed test	1.Manual 2.Automatic		
4.Odometer test			
5.Read DTCS			
6.Erase DTCS			
7.Sensor pairing			
8.Clock test			
9.PIN code			
10.Select Tacho.			
11.Product info.			
12.Language.			

3.2.8. Digital ACTIA

DIGITAL ACTIA

1.Measure W	1.Manual 2.Photo sensor	
2.Parameters	1.Calibration	1.W factor 2.K factor 3.L (Tyre Circ.) 4.Tyre Size 5.Max.Auth.Speed 6.Odometer 7.Time & Date 8.Next Cal. Date 9.Veh.Reg.Nation 10.Veh.Reg.Number 11.Veh.Id.Number 12.O/P shaft
	2.Other param.	1.ResetHeartbeat 2.TCO1 priority 3.O/P shaft 4.CAN rep.rate 5.Part number
	3.Specific	1.Default Lang 2.Card Language 3.Backlight conf. 4.Drv1 ign.ON 5.Drv2 ign.ON 6.Drv1 ign.OFF 7.Drv2 ign.OFF 8.Install. date
	4.Information	1.Supplier Id 2.Manufact. Date 3.Serial number 4.Hardware number 5.Hardware vers. 6.Software number 7.Software vers. 8.License number
3.Speed test	1.Manual 2.Automatic	
4.Odometer test		
5.Read DTCS		
6.Erase DTCS		
7.Sensor pairing		
8.Clock test		
9.PIN code		
10.Select Tacho.		
11.Product info.		
12.Language.		

3.2.8. Digital EFAS

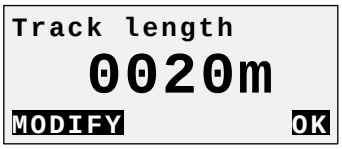
DIGITAL EFAS

1.Measure W	1.Manual 2.Photo sensor		
2.Parameters	1.Calibration	1.W factor 2.K factor 3.L (Tyre Circ.) 4.Tyre Size 5.Max.Auth.Speed 6.Odometer 7.Time & Date 8.Next Cal. Date 9.Veh.Reg.Nation 10.Veh.Reg.Number 11.Veh.Id.Number 12.O/P shaft	
	2.Other param.	1.ResetHeartbeat 2.TCO1 priority 3.O/P shaft 4.CAN rep.rate 5.Part number	
	3.Specific	1.CAN-A activat. 2.CAN-A tr.rate 3.CAN-A ID mode 4.CAN-A sample 5.CAN-A pro.tach 6.CAN-A pro.diag 7.Trip Reset 8.ExtSerial act. 9.ExtSerial prot 10.Illumination 11.Engine Speed	12.N Factor 13.EngSpdThreshold 14.SpeedThresholds 15.Lang.Handling 16.PrtLocalTimeEn 17.CAN-C activat. 18.CAN-C tr.rate 19.CAN-C ID mode 20.CAN-C sample 21.RemoteDataTrans
	4.Information	1.Supplier Id 2.Manufact. Date 3.Serial number 4.Hardware number 5.Hardware vers. 6.Software number 7.Software vers. 8.License number	
3.Speed test	1.Manual 2.Automatic		
4.Odometer test			
5.Read DTCS			
6.Erase DTCS			
7.Sensor pairing			
8.Clock test			
9.PIN code			
10.Select Tacho.			
11.Product info.			
12.Language.			

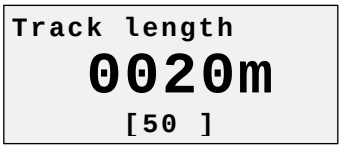
4 Functions description

4.1. Measure W

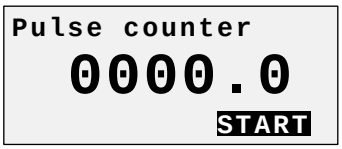
4.1.1. Manual



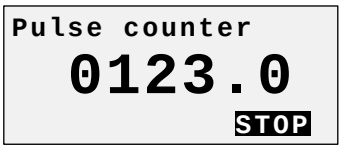
1. Check the track length.
Press F3 (OK) to go on, or press F1(MODIFY) to change the track length.



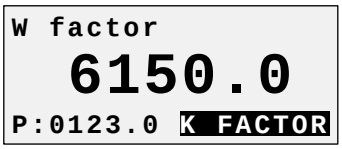
(optional)
to set the 'Track length', enter the new value and press 'Ent'.



2. Press F3 (START) and drive the vehicule along the track.
The pulse count will start.



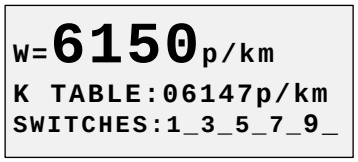
3. At the end of the track, press F3 (STOP).
The W factor will be calculated as a function of the pulse count and the track length.



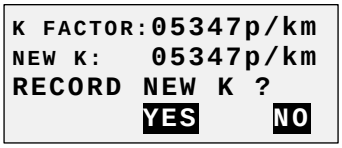
4. Press F3 (K FACTOR) to access K factor setting.

K1318 →

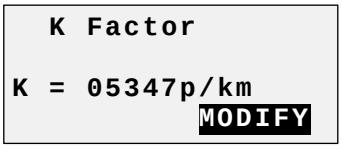
Other tachographs ↓



5. The closest value from the K factor table of the 1318 is displayed with the corresponding switches positions.
Press 'Esc' to go back to main menu.



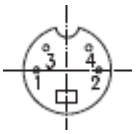
5. Present K factor will be read from the tachograph and displayed.
'NEW K' is the W factor that has been measured and should be recorded as the new K factor.
Press F2 (YES) to record it or F3 (NO) to leave it unchanged.



6. If 'YES' has been selected previously, the new K factor will be read back from the tachograph.
This factor can modified manually if required pressing F3 (MODIFY).

4.1.2. Photo Sensor

The W measure with a photosensor is exactely the same as in manual mode, except that the 'START' and 'STOP' pulses are generated by the sensor. In photo sensor mode, the 'F3' (START & STOP) will not be active.
You can connect any photo sensor using a MiniDIN 4-pins connector connected to the left connector of the CD400.



- Shielding: Ground (GND 0V).
- Pin n°2: photo sensor signal (the signal should be low when the reference object/reflector is not detected).

4.1.3. Rolling road.

[Under development]

4.1.4. Constant speed.

[Under development]

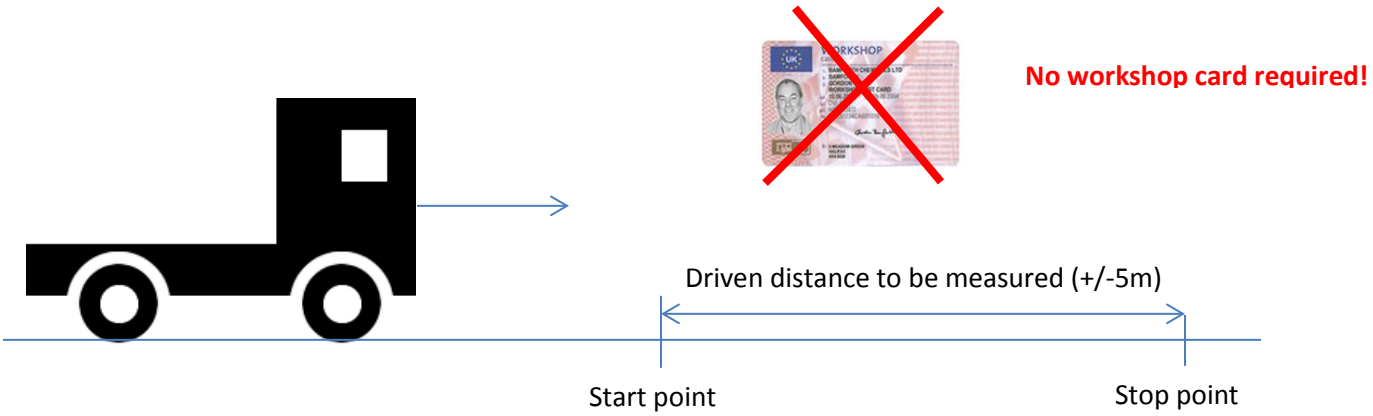
4.1.5. Draw-wire.

[Under development]

4.1.6. Odometer (only for digital tachographs).

[Under development]

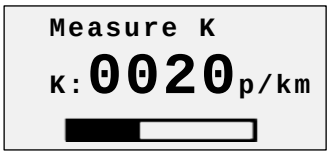
Using the odometer parameter to measure the W factor does not require the workshop card.
Therefore, this function can be useful for transport companies or for the authorities.
The latest is calculated by measuring the distance driven by a vehicle when the high resolution odometer is incremented by 5m.



	Start Point detection Drive slowly...		Drive slowly, the CD400 will detect the Start Point within +/- 5m.
	Mark Start Point OK		Mark the Start Point on the ground.
	Stop Point detection Drive slowly...		Drive slowly, the CD400 will detect the Stop Point in around 5m (depending on last calibration accuracy).
	Enter distance: [503]cm		Measure the driven distance using a decameter and enter the value in centimeter into the CD400.
	K: 5546 p/km W: 5512 p/km Error: + 000.6 % OK		As a result, the CD400 will display the K factor of the tachograph, the W factor of the vehicle and the calibration error in %.

4.2 Measure K

This function is available only for the K1314/1318 and the FTCO 1319.



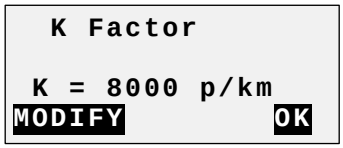
Measuring the K factor takes a few seconds.
The value is updated every time the progress bar is completed.

4.3. Parameters

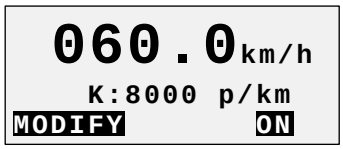
The parameter list is available at: 3.2. Menu trees

4.4. Speed test

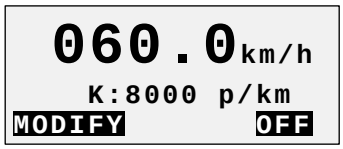
4.4.1 Manual



For the K1314/1318 the K reference is set to the last K measured if available, otherwize it is set to 8000. For the other tachographs the K reference is set to the K factor programmed in the tachograph.
If required, the K reference can be adjusted manually pressing 'F1' (MODIFY).

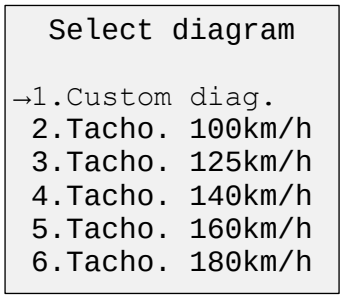


By default the speed is set to 60 km/h.
Press F1 (ON/OFF) to start/stop speed simulation.
The text "km/h" is blinking when the speed is currently simulated.

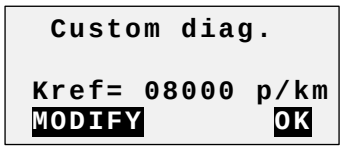


Pressing the '↑' and '↓' keys, will increase/decrease the speed by 1km/h steps.
Pressing the '←' and '→' keys, will increase/decrease the speed by 0.1km/h steps.
Press F1(MODIFY) to insert a new speed value.

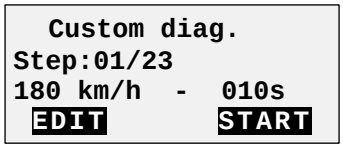
4.4.2 Automatic



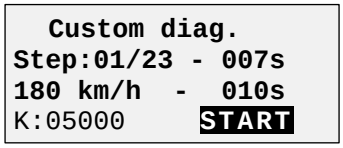
Select the speed diagram to be executed and press 'Ent'.



For the K1314/1318 the K reference is set to the last K measured if available, otherwize it is set to 8000.
For the other tachographs the K reference is set to the K factor programmed in the tachograph.
If required, the K reference can be adjusted manually pressing 'F1' (MODIFY).
Press 'F3' (OK) if you agree with the K factor value.

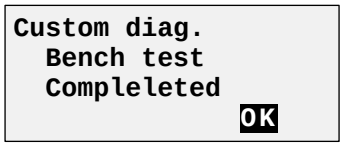


Using the '↑' and '↓' keys, you can check the speed and duration of each step of the automatic test.
Press 'F3' (START) to start the test.
The 'EDIT' funtion (F1) is available only for the custom diagram to edit the speed and duration of current step of the automatic test. The automatic test will end at the first step at which the duration is set to zero.



A count down will show the time left for present step.

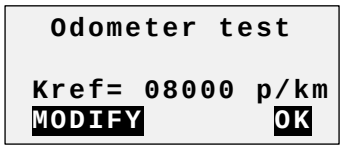
Press 'F3' (STOP) to stop the bench test



Bench test completed.
Press 'F3' (OK) to go back to the menu.

4.5. Odometer test

The programmer will automatically simulate a speed of 50km/h on 1000m distance and check if the odometer as been incremented by 1000m.

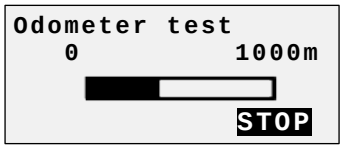


For the K1314/1318 the K reference is set to the last K measured if available, otherwize it is set to 8000.
For the other tachographs the K reference is set to the K factor programmed in the tachograph.

If required, the K reference can be adjusted manually pressing 'F1' (MODIFY).

KTCO1318/FTCO1319/EGK100

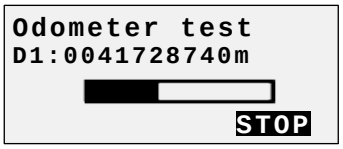
Press 'F2' to adjust the position of the start point.
Press 'F3' (START) to start the test.



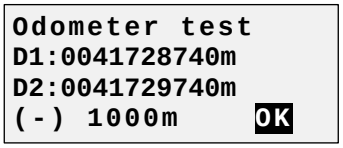
Wait until the progress bar is completed.
The test can be aborded pressing 'F3' (STOP).

MTCO/VR2400/DIGITAL

The inital value of the odometer (D1) will be read.
Press 'F3' (START) to start the test.



Wait until the progress bar is completed.
The test can be aborded pressing 'F3' (STOP).

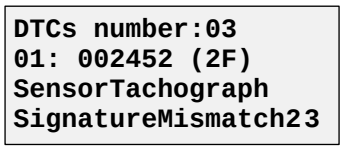


At the end of the test, the final odometer value will be read (D2). The difference between D2 and D1 will be calculated (D2-D1). If the difference equals 1000m, the test has been successful.

4.6. Read DTCs

The function "Read DTCs" is used to read the "Diagnostic Trouble Codes" (DTC) stored in the error memory of the tachograph.

It is available for the following tachographs:
- Digital tachographs (DTCO1381, SE5000, SmarTach & EFAS)



DTCs number is the error number available in memory
Error code
Full error description

Use the '↑' and '↓' keys to select next or previous error.
Press 'Esc' to go back to main menu.

4.7. Erase DTCs

The function "Erase DTCs" is used to erase the "Diagnostic Trouble Codes" (DTC) stored in the error memory of the tachograph.

It is available for the following tachographs:
- MTCO 1324/1390
- VR2400
- Digital tachographs (DTCO1381, SE5000, SmarTach & EFAS)

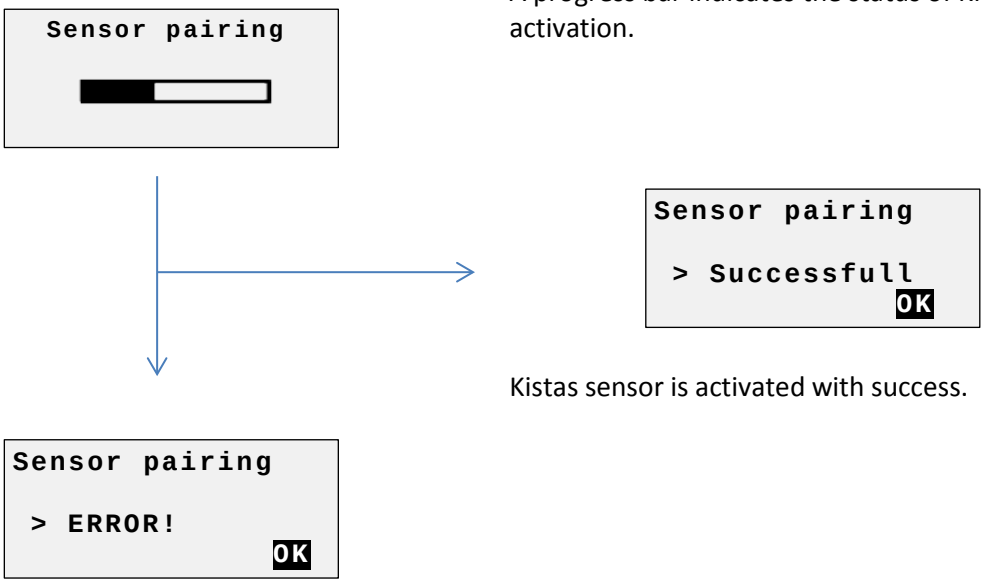
The following message is displayed after erasing the error memory.

Press 'Esc' to go back to main menu.

4.8. Sensor Pairing (Kitas activation)

This function is available for the following tachographs:
- MTCO 1324/1390
- VR2400
- Digital tachographs (DTCO1381, SE5000, SmarTach & EFAS)

Sensor pairing is executed automatically after modifying any calibration parameter on digital tachographs.



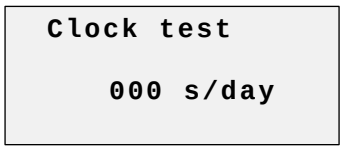
A progress bar indicates the status of KITAS activation.

Kistas sensor is activated with success.

No response received from KITAS.

4.9. Clock test

The clock test function will check the accuracy of the clock of the tachograph.
For the K1314, the K1318 and the k1319, an external clock sensor has to be used.



The measure is updated every second.
The result represents the clock deviation in seconds/day.
Press 'Esc' to go back to main menu.

4.10. PIN code

The "PIN code" function permits to send the workshop card PIN code to the tachograph automatically.
This function is available for the Digital tachographs (DTCO1381, SE5000 & EFAS)

```
  PIN code

→1.Card 1
 2.Card 2
 3.Card 3
 4.Card 4
 5.Card 5
```

Select the workshop card ID in the list (ie: name of owner) and press 'Ent'.

```
  PIN code
 Card 1
 #6 PIN:******
 MODIFY        OK
```

Press F1(MODIFY) to modify the data.
Press F3(Ok) to send the code.

MODIFY (card name, PIN code & protection code).

```
  PIN code
 Card 1
  ^
 [ ]  -   0   A   M
```

Edit the card id.
Select the digit using the '←' & '→' keys and set the digit value using the '↑' & '↓' keys. Then press 'Ent'.

```
  PIN code
 Card 1
 #6
  ^
```

Adjust the PIN code length using the '↑' and '↓' keys and press 'Ent'.

```
  PIN code
 Card 1
 #6 PIN:D00000
        ^
 [ ]  -   0   A   M
```

Edit the PIN code.
Select the digit using the '←' & '→' keys and set the digit value using the '↑' & '↓' keys. Then press 'Ent'.

```

```

Enter a protection code which will be required to be able to send the PIN code.
The code can be from 1 to 4 digits long or can be left blank if not necessary.

OK (send data).

```
  PIN code
Protection code:
    (****)
```

Enter the protection code and press 'Ent'

```
  PIN code
PIN code sent
Check tacho.
```

Response 1.
PIN code has been sent.

Check Tachograph.

```
  PIN code
TCO already in
Calibration mode
```

Response 2.
The tachograph is already in calibration mode.

No PIN code required.

```
  PIN code
Conditions
not correct
```

Response 3.
The tachograph is not ready to receive the PIN code (i.e. no card inserted).

4.11. Select tachograph

```
 Select Tacho.
→1.KTCO 13xx/1318
 2.MTCO1324/1390
 3.Motomet.EGK100
 4.Kienzle 1319
 5.V.Root VR2400
 6.Digital VDO
 7.Digital SE5000
 8.Digital Actia
 9.Digital EFAS
```

The tachograph type is detected automatically on power ON, but if for any reason, another type has to be selected, this can be done manually.

Select the tachograph type in the menu and press 'Ent'.

4.12. Product info

```
CD400 Programmer
 Sn: 56000010
 SW: V2.0 r07
 www.cdconcept.be
```

Shows software version and serial number.

4.13. Language

```
    Language
→1.English
 2.Deutsch
 3.Español
 4.Français
 5.Nederlands
 6.Português
 7.Turkish
 8.Romanian
 9.Russian
```

Select the language in the menu and press 'Ent'.